

REMARKS

Claims 1-20 are pending in the application with claim 20 presently added.

Claims 1-9 and 11-19 have been rejected. Claims 1-3 have been rejected under 35 USC §102(b) as being anticipated by Mesquida (US 4703219). Claims 1-2, 11-13 and 18-19 have been rejected under 35 USC §102(b) as being anticipated by Nomura et al (US 5493427). Claims 1-2 and 4-6 have been rejected under 35 USC §102(e) as being anticipated by Koike et al. (US 6345903). Claim 14 has been rejected under §102(e) as being anticipated by Myers (US 6330111). Claim 7 has been rejected under 35 USC §103(a) as being unpatentable over Mesquida in view of Matthies et al. (US 6476783). Claims 8-9 have been rejected under §103(a) as being unpatentable over Mesquida in view of Ishihara (US 6535256). Claims 15-16 have been rejected under §103(a) as being unpatentable over Myers in view of Nomura. Finally, claim 17 has been rejected under §103(a) as being unpatentable over Myers in view of Matthies.

Claim 10 is objected to as being dependent upon a rejected base claim, but would be allowable over the prior art of record if rewritten in independent form.

Claim 1 has been amended. Claims 4, 7 and 10 have been amended to place them in independent form. Claims 18 has been amended to highlight a feature of the invention, taken from claim 19, and claim 19 correspondingly amended.

Claim 20 has been added.

Reconsideration and allowance of all claims is respectfully requested in view of the foregoing remarks.

Claim Rejections - 35 USC § 102 and §103

A. Mesquida Does Not Teach All Elements of Amended Claim 1

Claim 1 has been amended to include the added limitation from claim 6. Mesquida admittedly does not include such a feature. Accordingly, claims 1-3 should be in condition for allowance.

B. Nomura Does Not Teach All Elements of the Claims

Claims 1-2, 11-13 and 18-19 have been rejected under 35 USC §102(b) as being taught by Nomura et al. (5,493,427) owned by Sharp Labs. Reconsideration an allowance of all claims (including newly added claim 20) in view of the following remarks is respectfully requested.

Nomura discloses in FIGs. 4-8 and 12 a display capable of displaying 3-D images without requiring a viewer to wear special glasses. In FIG. 4, the LCD display includes adjacent

pixels pairs (e.g. DD_{11} , DD_{12}) that are associated with a single cylindrical lens (e.g. LL_1). The image from pixel DD_{11} is focused to viewing space PP – for the left eye of the viewer – and the pixel DD_{12} is focused to viewing space QQ – for the right eye of the viewer. The image displayed by each pixel is the same or slightly different from that of the corresponding pixel from the pixel pairs to create for the viewer the illusion of parallax or a 3-D image on the screen.

The present invention as claimed is different from Nomura embodied in FIG. 4 in two main respects. First, each cylindrical lens in Nomura runs vertically along the display and not horizontally as with the present invention. The vertical arrangement of the lenses in Nomura is required to focus light from the pixel pairs to the right and left of the lens to correspond with the horizontal spacing of the eyes of a viewer. Nomura could not operate to create the illusion of parallax in right and left eyes if the cylindrical lenses were arranged horizontally as with the present invention. Second, the cylindrical lenses are not “in substantial registry” (claim 1) with a display element but rather correspond to a pair of display pixels. (Nomura, col. 3, lines 46-47) A pair of pixels cannot be said to define a “display element” especially since it is the purpose of the pixel pairs to be slightly different from one another to cause a simulated parallax effect.

The preferred embodiment of the present invention, in contrast with that disclosed in Nomura, contemplates matching a lens with a specific subpixel color stripe to prevent color distortion when the image is viewed by a viewer. Nomura identifies the problem of color distortion in col. 15, lines 6-10 but mitigates the problem by arranging the lenses vertically, not by matching the lenses horizontally with each color stripe.

Nomura FIG. 12 shows a similar system to that shown in FIG. 4 except that the fixed lens system is replaced with a variable lens system. As before, each lens runs vertically down the face of the display screen and corresponds to a pair of pixel elements. The lens element moves in a lateral direction relative to the pixel pair so that the P/Q display areas are moved to adjust for different head (and thus left/right eye) locations in front of the screen. The longitudinal direction of the cylindrical lens is set such that the direction is in conformity with an array direction of pixels displaying the same parallax images in the liquid crystal panel. (col. 15, lines 34-37) The lenses are not arranged horizontally and are not in registry with individual display elements, but rather are arranged vertically and in registry with a pair of pixel columns. Again, since the color stripes of standard LCD display panels are arranged vertically in Nomura (as they are in the present invention), the lenses do not need to be matched to each stripe as they would in the present invention.

Claims 11-13 are additionally not anticipated by Nomura because (1) there is not a 1:1 display element to lens ratio, (2) therefore the relationship of the display element in Nomura

with the respective lens is meaningless, and (3) the distance between lens centers is always going to be more and not less than the distance between centers of adjacent light emitting elements as shown best in Nomura's FIG. 4 (contrary to the Examiner's assertion, FIG. 6 also shows that centers of adjacent light emitting elements – G12 and G11 – are closer together than centers of adjacent light directing elements L1 and L2).

Regarding claims 18-19, Nomura fails to disclose directing light from a first of a plurality of light emitting pixel elements in a "first preferential direction". Instead, FIG. 6 of Nomura shows light from pixel elements (Gn1, Gn2) being directed through light directing element (Ln) in two directions (toward J and I, respectively) to create simulated parallax with a viewer's eyes. This effect forms the entire basis of the Nomura invention. Directing light of adjacent pixel elements in the same direction, in fact, defeats the whole purpose of the Nomura invention. Claim 18 of the present invention has been amended to clarify this feature of the invention. It would thus be improper to reject claims 18-19 based on the Nomura reference.

Added claim 20 clearly distinguishes the present invention from the display disclosed in Nomura.

C. Applicants Swear Behind Koike and Myers References

Claims 1-2 and 4-6 have been rejected under 35 USC 102(e) as being anticipated by Koike et al. (6,345,903) with a filing priority date of September 1, 2000. Claim 14 has been rejected under 35 USC 102(e) as being anticipated by Myers (6,330,111) with a filing priority date of August 17, 2000. Claims 15-16 have been rejected under §103(a) as being unpatentable over Myers in view of Nomura. Claim 17 has been rejected under §103(a) as being unpatentable over Myers in view of Matthies et al. (6,476,783).

Applicants swear behind these references, thus removing them as prior art, because applicants conceived of the invention prior to these priority dates and diligently reduced the inventions to practice. (see Section 1.131 Affidavit with attached/dated Invention Disclosure dated February 14, 2000). No rejections to claims 4-6 and 14-17 remain outstanding and thus such claims should be in condition for allowance.

D. It Would Not Be Obvious to Add a Contrast-Enhancing Element (Matthies) to a Light Concentrator (Mesquida).

Claim 7 has been rejected under §103(a) as being obvious over the combination of Mesquida in view of Matthies et al. (U.S. 6,476,783). Specifically, the Examiner states that it

would be obvious to add a black coating between the inactive regions of the Mesquida lenses to enhance the contrast of the display.

Applicants respectfully disagree that one would be encouraged to combine the Mesquida lens arrangement with the Matthies black coating. The references, in fact, teach away from one another in this respect. Mesquida is a light concentrator to better project and focus diode-generated light. Having a black coating between lenses would only enhance the appearance of concentric circles of light – a distinct disadvantage to light projectors. While such a contrast might be desired for image-producing pixel arrays such as Matthies, they are a disadvantage for such devices as Mesquida. Accordingly, one skilled in the art would not be motivated to combine the teachings of the Mesquida reference with the Matthies reference to teach all limitations of the present invention as embodied in claim 7 of the application.

E. Neither Mesquida or Ishihara et al. (6,535,256) Teach All Elements of Amended Claims 8-9.

Base claim 1 has been amended to incorporate features not found in Mesquida or Ishihara. These claims (and in particular claims 8-9) should now be in condition for allowance.

CONCLUSION

For the foregoing reasons, reconsideration and allowance of claims 1-20 of the application as amended is solicited. The Examiner is encouraged to telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

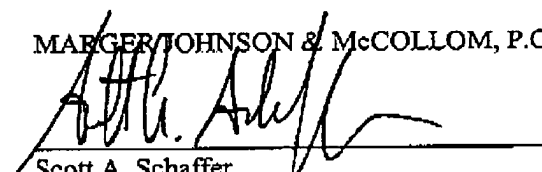


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Respectfully submitted,

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